

NEW ALLOYS OFFER WIDER RANGE OF PHYSICAL PROPERTIES



TECHNICAL BULLETIN #247

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.



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INTRODUCTION

LEACH AND GARNER #247 Alloy has been developed and refined to a degree that permits its use in many applications where formerly only #226 could serve. The nominal composition of #247 is:

Platinum	-	1.0 %
Palladium	-	44.0 %
Gold	-	0.5 %
Silver	-	38.5 %
Copper	-	13.6 %
Nickel	-	1.0 %
Zinc	-	1.4 %

It may be noted from the composition that there is a reduction of 9.0% Platinum and 9.0% Gold in this alloy compared to #226 making it somewhat less resistant to tarnish. This reduction in Gold and Platinum content lowers the intrinsic value of the alloy which makes it an economical substitute for #226 where service conditions do not demand the full capabilities that #226 provides.

Since perfecting the processing of #247, it has become a popular low priced alloy that can substitute economically for #226 in many applications.

The data sheets on physical properties show this alloy available in both wire and sheet in various temper grades.

PHYSICAL PROPERTIES OF L&G #247

SHEET & WIRE

	<u>Solution</u> <u>Annealed</u>	<u>Age</u> <u>Hardened</u>
Resistivity, ohms /cmf nominal	180	150
Conductivity - % IACS	5.7	6.9
Temperature Coef. of Expansion /°C (30-100) nominal	7.5 x 10 ⁻⁶	
Temperature Coef. of Resistance /°C (0-100)	.00033	
Density (Grams/cc) nominal	10.65	10.65
Density (dwt. /cu. in.)	112.3	112.3
Temperature of fusion, F nominal	1960°F	
Color: Platinum White		

MECHANICAL PROPERTIES OF L&G #247

SHEET & WIRE

	<u>Solution</u> <u>Annealed</u>	
Modulus of Elasticity p.s.i.	16 x 10 ⁶	
Ultimate Tensile Strength p.s.i.	90,000 - 130,000	
Proportional Limit p.s.i.	60,000 - 105,000	
Elongation in 2" nominal	30 %	
Grain Size (Equi-Axed Structure) nominal	.005 mm	
Diamond Pyramid Hardness (200 Gr. Load)	200-235	
Knoop Hardness (100 Gr. Load)	200-230	
Spring Force Applications	*	
Creep under Sustained Load within Prop. Limit	NIL	
Angle of Set		

*Must be aged

	<u>Ductile</u> <u>Grade</u>	<u>Fully</u> <u>Aged</u>
Modulus of Elasticity p.s.i.	16 x 10 ⁶	16 x 10 ⁶
Ultimate Tensile Strength p.s.i.	150,000 - 165,000	165,000 - 215,000
Proportional Limit p.s.i.	125,000 - 145,000	145,000 - 200,000
Elongation in 2"	12 % - 18 %	2 % - 12 %
Diamond Pyramid Hardness (200 Gr. Load)	350-380	380-450
Knoop Hardness (100 Gr. Load)	340-370	370-430
Fatigue (Hunter Tester) x 10 ⁸ cycles	50,000 ⁺	

SELECTION OF TEMPER

L&G #247 is offered in four temper selections:

1. Solution Annealed
2. Ductile Grade (Special Age Hardened)
3. Fully Aged
4. Age Hardened from Cold Worked Condition

In the Solution Annealed Condition #247 is ductile, easily formed and is clean blanking. It is the preferred form for heavy forming, dimpling and bending. Following forming it should be aged to produce high spring values and wear properties.

The Ductile Grade substitutes for the now obsolete term "Age Hardened-Stress Relieved." This grade retains 10-15% elongation and permits considerable simple forming such as hooks on wire after molding or 90° twists after cutting strips to length. Wear and spring properties remain high and such stock has equiaxed fine grain. Precise control is necessary to obtain these results. We do not advise the customer to attempt to create this temper condition himself.

When all forming has been done and high values of ageing are to be obtained, or if the customer wishes stock at ultimate values, it should be Fully Aged.

When Age Hardened from the cold worked condition after prior solution annealing, #247 will reach amazing tempers. Samples have shown hardness values of K₁₀₀ 550. Needless to say, such stock is exceedingly brittle. It is possible that designers or engineers could have a need for such high hardness values in applications where there is no distortion and brittleness is no factor.

USES

L&G #247 has not been fully evaluated. It can be substituted for #226 (see Technical Bulletin #226) in many applications where cost is a factor and there can be a measure of relaxation on the service and corrosion parameters. We recommend that interested customers write for samples of #247 for test purposes on their contemplated applications. It is likely that when this alloy has become as familiar in the trade as #226 it will be readily accepted as a substitute in a wide variety of applications.

GRAPHS OF L&G #247 ALLOY

Much valuable data may be obtained from the following curves. Publication of this information is in line with our policy of extending to you, our valued customers, as much data and information as is presently available. We recommend that a study of this brochure be made by designers and engineers to acquaint themselves with #247 alloy. We are sure that this alloy has many uses hitherto untried. Where cost is a factor, #247 may be the answer.

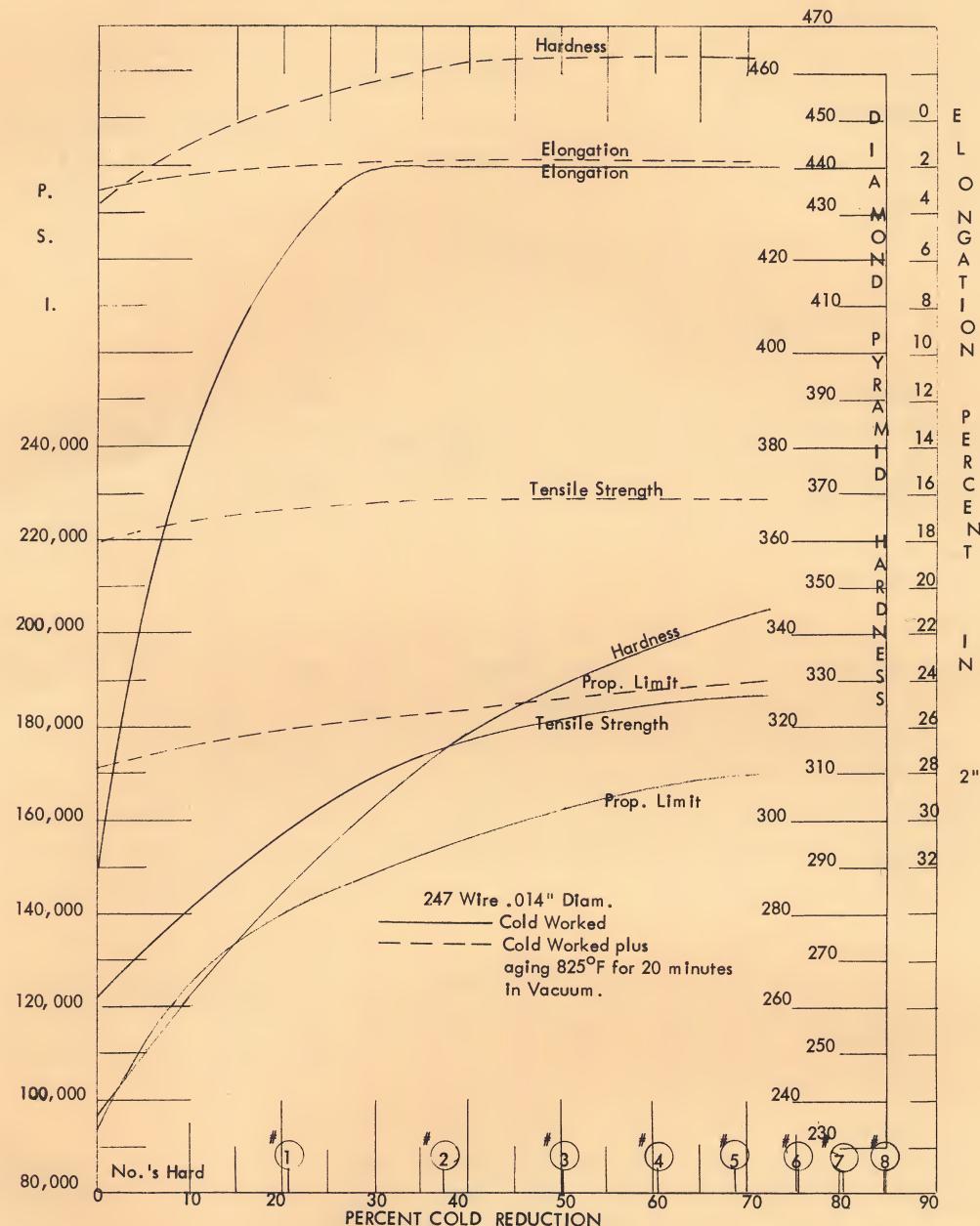
FORMS AVAILABLE

L&G #247 is marketed through General Findings Inc., affiliate of Leach and Garner Co., and is available in strip and wire as well as rod. The minimum diameter furnished in wire form is .004".

STRIP ...	Gauge	Width
	.001"	x 1/4" or narrower
	.002"	x 1/2" or narrower
	.003"	x 3/4" or narrower
	.004"	x 1" or narrower
	.005"	x 1-1/4" or narrower

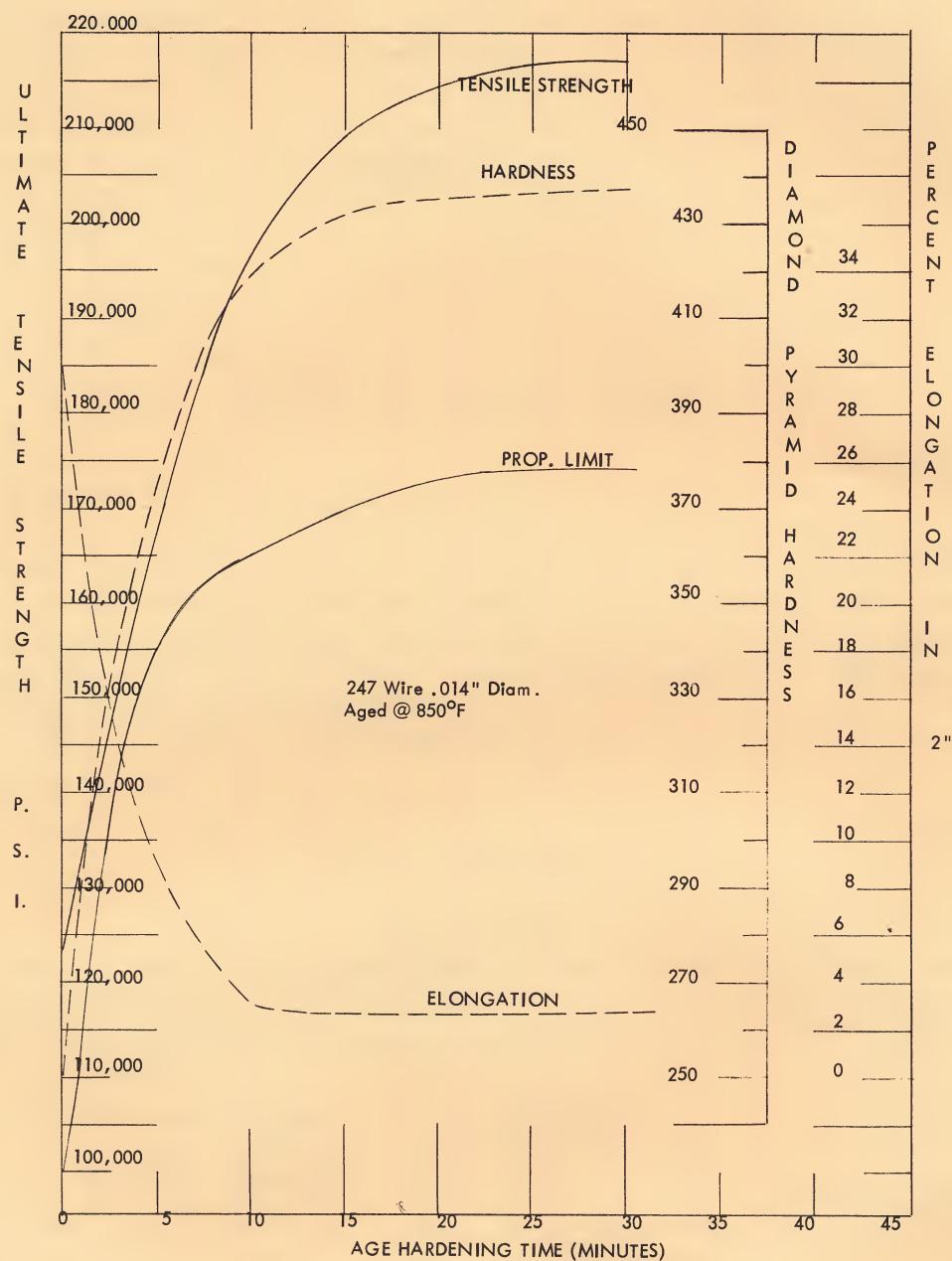
YOUR FIRST CONSIDERATION, THEREFORE, WHEN
SPECIFYING STOCK OR PARTS OF L&G #247 SHOULD
BE GENERAL FINDINGS INC. WHERE METALLURGICAL
PROGRESS KEEPS PACE WITH INDUSTRY'S NEEDS

PLATE NO. 1



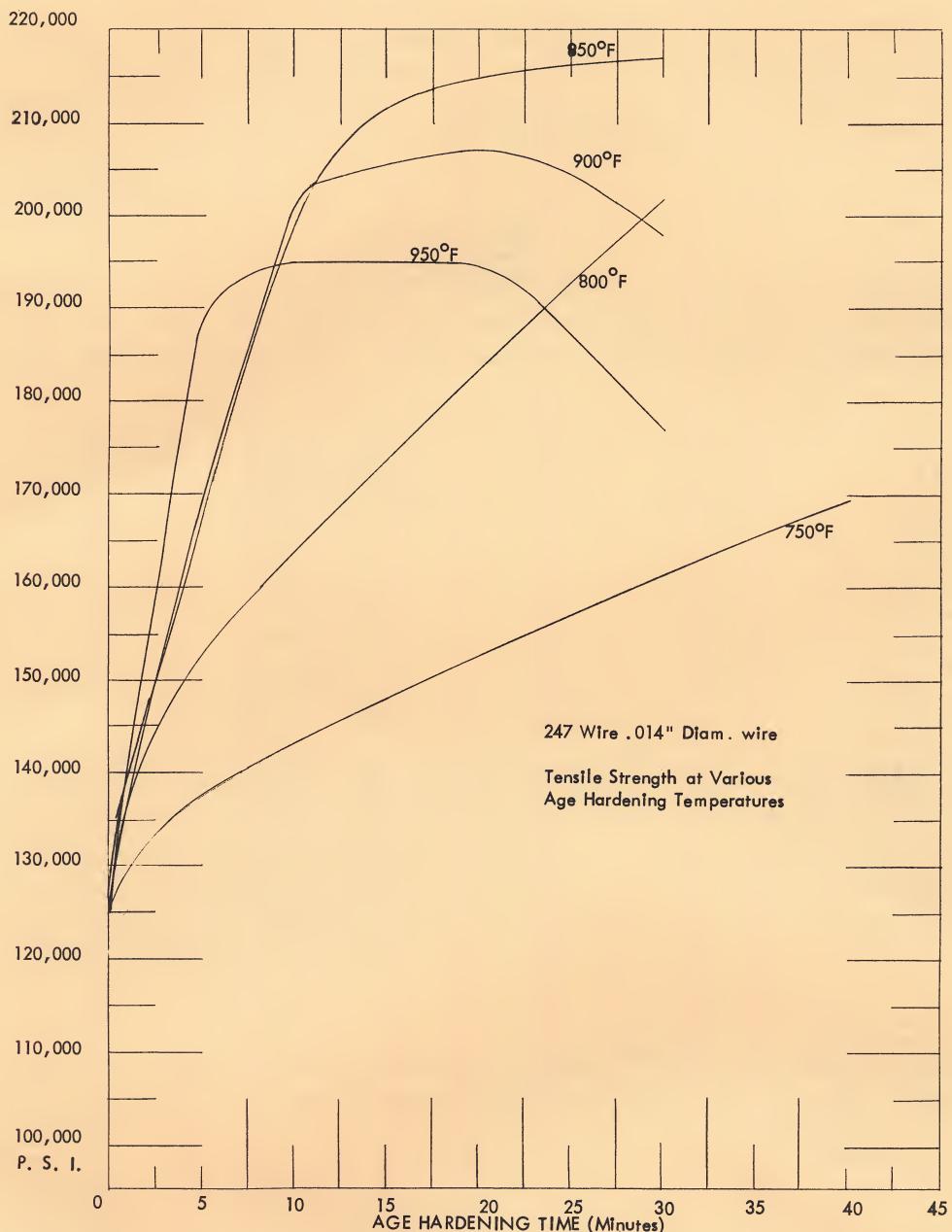
This composite graph illustrates the effect of cold work on L&G #247 alloy as shown in solid lines. Subsequent Age Hardened results from these values are shown on dotted lines. The hardness values shown after ageing definitely indicate a brittle range.

PLATE NO. 2



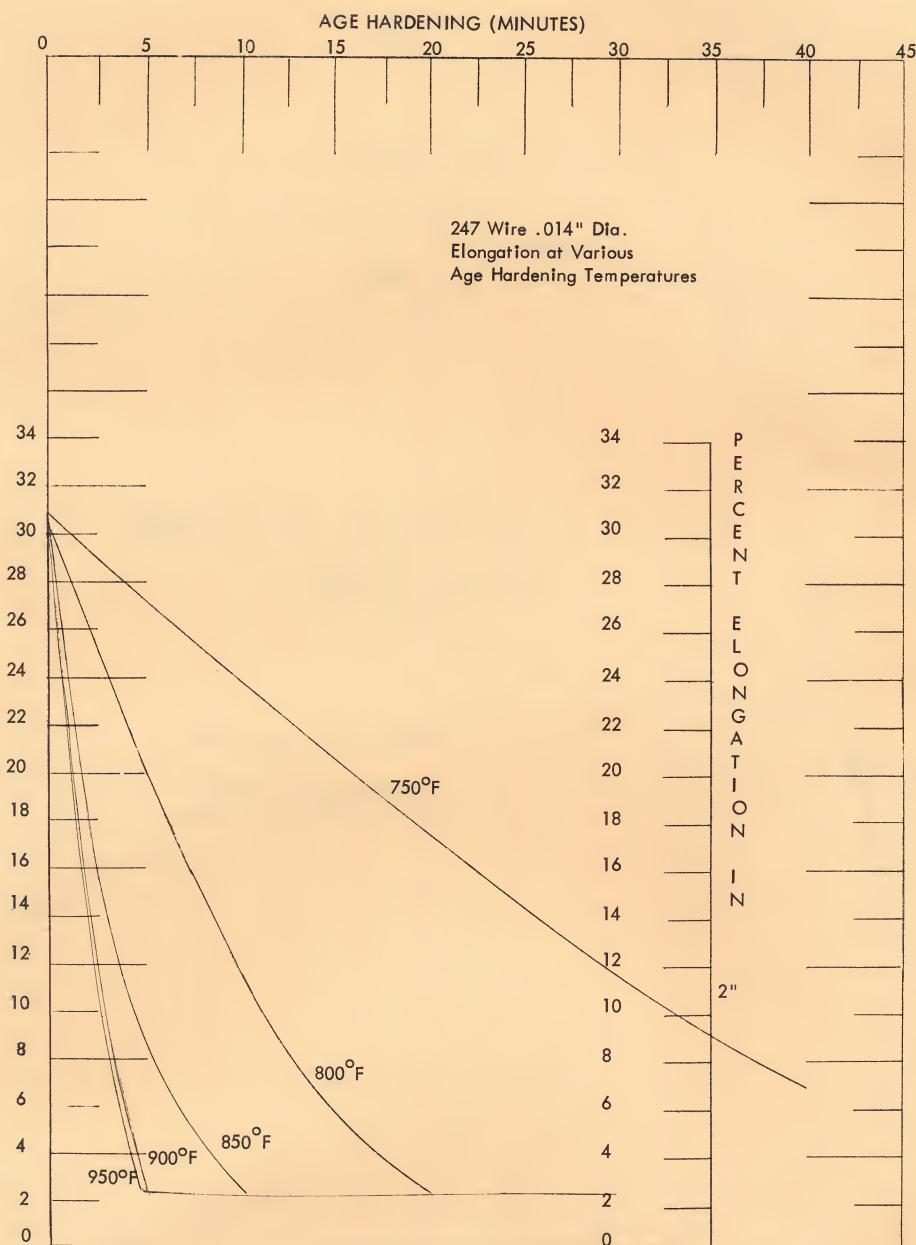
L&G #247 alloy wire aged from the solution annealed condition at 850°F in vacuum. Ductility has been retained although a brittle range appears at about 390 DPH. Note the rapid aging rate which emphasizes the need for close accurate control.

PLATE NO. 3

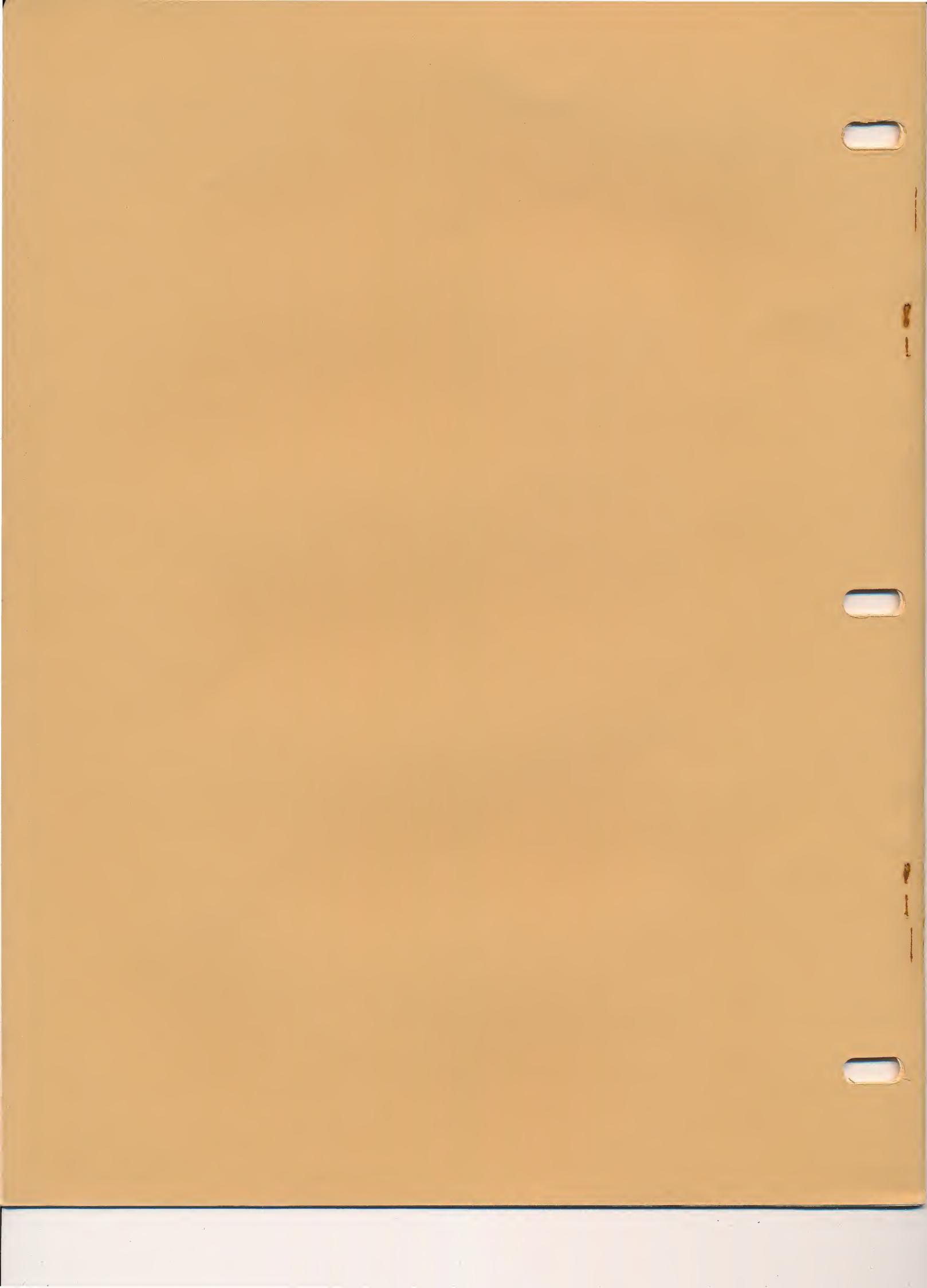


Selection of the proper time and temperature is illustrated in Plate No. 3. It is obvious that if overageing is to be avoided, temperatures below 900°F be used. This is particularly true if age hardening batch work is necessary as non-uniform heating can occur due to improper or excessive loading. This can cause a wide discrepancy in hardness values from the same lot of parts.

PLATE NO. 4



Relative % of Elongation may be anticipated from the curves on Plate No. 4. It may be noted that if ductility is important it may be obtained readily when aged in the 750° - 800° F range.



NEW ALLOYS OFFER WIDER RANGE OF PHYSICAL PROPERTIES



TECHNICAL BULLETIN #205

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.



TECHNICAL BULLETIN #205

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.

INTRODUCTION

Leach and Garner #205 has long held a prominent place in the Electronic field. This age hardenable alloy is especially corrosion resistant because of the 80 % Gold/Platinum content.

Although the alloy itself is not new, the correct processing procedures are. The nominal formula is:

Gold	-	71.0 %
Platinum	-	9.0 %
Silver	-	5.0 %
Copper	-	14.0 %
Zinc	-	1.0 %

L&G #205 is difficult to work. It is subject to coarse grain and stress cracking. To refine the grain, we add two well known elements in the order of .5% substituting these for the equivalent of Copper in the formula. The result of this addition reduces the grain size and minimizes cracking in processing. These additives may be eliminated if desired and so specified. This may be necessary where Nickel and/or Cobalt can not be tolerated.

Throughout the factory, both in the Mill Division (Leach and Garner Co.) and in the Final Processing and Fabrication Division (General Findings Inc.), specialized equipment is employed as well as carefully controlled processing procedures to consistently produce the highest quality in both sheet and wire.

PHYSICAL PROPERTIES OF L&G #205

SHEET & WIRE

	<u>Solution Annealed</u>	<u>Age Hardened</u>
Resistivity, ohms/cm ² nominal	135	80
Temperature Coef. of Resistance / °C (0-100) nominal	.00005	.00067
Density (Grams / cc)	15.9	15.9
Density (dwt. / cu. in.)	167.5	167.5
Temperature of Fusion, F	1750	1750

MECHANICAL PROPERTIES OF L&G #205

SHEET

	<u>Solution Annealed</u>	<u>Ductile Grade</u>
Modulus of Elasticity	16 x 10 ⁶	16 x 10 ⁶
Ultimate Tensile Strength p.s.i.	85,000 - 120,000	125,000-140,000
Elongation in 2" Percent	15 - 30 %	10 - 15 %
Proportional Limit	65,000 - 90,000	90,000-105,000
Diamond Pyramid Hardness (200 Gr. Load)	200 - 235	290 - 325
Knoop Hardness (100 Gram Load)	190 - 225	280 - 315

Fully
Aged Work Hardened
and Aged

Modulus of Elasticity	16 x 10 ⁶	16 x 10 ⁶
Ultimate Tensile Strength p.s.i.	135,000-160,000	145,000-180,000
Percent Elongation in 2"	4 - 10 %	0 - 4 %
Proportional Limit	110,000-140,000	120,000-160,000
Diamond Pyramid Hardness (200 Gram Load)	325 - 355	325 - 370
Knoop Hardness (100 Gram Load)	315 - 345	315 - 360

MECHANICAL PROPERTIES OF L&G #205 WIRE

	<u>Solution Annealed</u>	<u>Ductile Grade</u>
Modulus of Elasticity	16×10^6	16×10^6
Ultimate Tensile Strength p. s. i.	90,000 - 120,000	125,000 - 140,000
Percent Elongation in 2"	18 - 35%	12 - 18%
Proportional Limit p. s. i.	70,000 - 90,000	90,000 - 120,000
Diamond Pyramid Hardness (200 Gram load)	200 - 235	290 - 325
Knoop Hardness (100 Gram load)	190 - 225	280 - 315

	<u>Fully Aged From Annealed Condition</u>	<u>Fully Aged From Work Hardenable Condition</u>
Modulus of Elasticity	16×10^6	16×10^6
Ultimate Tensile Strength	140,000 - 170,000	150,000 - 190,000
Percent Elongation in 2"	5 - 12%	0 - 5%
Proportional Limit	120,000 - 160,000	140,000 - 190,000
Diamond Pyramid Hardness (200 Gr.load)	325 - 360	320 - 380
Knoop Hardness (100 Gr. load)	315 - 350	310 - 375

USES

L&G #205 alloy finds ready application as a sliding contact against #226 (or other) potentiometer resistance wires. It operates well against rings of L&G #201, L&G Coin Gold, L&G #212 and #213 alloys, and is suitable for both brush and ring applications.

L&G #205 may be soft soldered, welded, staked to arms or may be used by itself since it has excellent spring properties.

The alloy has been found excellent as a pivot in instrument jeweled bearings as a substitute for steel. Its low friction when operated against sapphire makes it very satisfactory when no lubricant can be tolerated.

It is excellent when used as printed circuit contacts.

AGE HARDENING

L&G #205 can be intricately formed in the Solution Annealed condition and subsequently Age Hardened to relatively high values which enhance wear resistance and spring properties. As "Cold Worked" the alloy is difficult to form and when Aged reaches very high levels of both tensile strength and hardness; however, it becomes inherently brittle allowing only the most minor forming. In this condition it could not be used satisfactorily, for example, in wire mounts struck after molding.

It is useful, therefore, to do all forming in the Annealed condition, then Age Harden.

We at General Findings Inc. have developed processing and ageing to the point where we can supply a highly ductile grade of sheet or wire Age Hardened to K₁₀₀-330 - 340 which retains all the desirable spring and wear properties and still permits considerable forming.

A study of the curves included in this bulletin illustrates the effect of time and temperature. Maximum hardness from the Annealed condition is attained rapidly above 800°F. It may be noted that the alloy is not subject to serious over-ageing; however, some increase in grain size occurs when excessive time is used. Over-ageing may occur at temperatures of 950°F for an extended time. This is particularly true for stock aged from the Cold Work condition.

FORMS AVAILABLE

L&G #205 may be obtained as rod, wire and strip. The minimum diameter we furnish is .004" in wire.

AS STRIP . . .

<u>Gauge</u>	<u>Width</u>
.001" x	1/4" or narrower
.002" x	1/2" or narrower
.003" x	3/4" or narrower
.004" x	1" or narrower
.005" x	1-1/4" or narrower

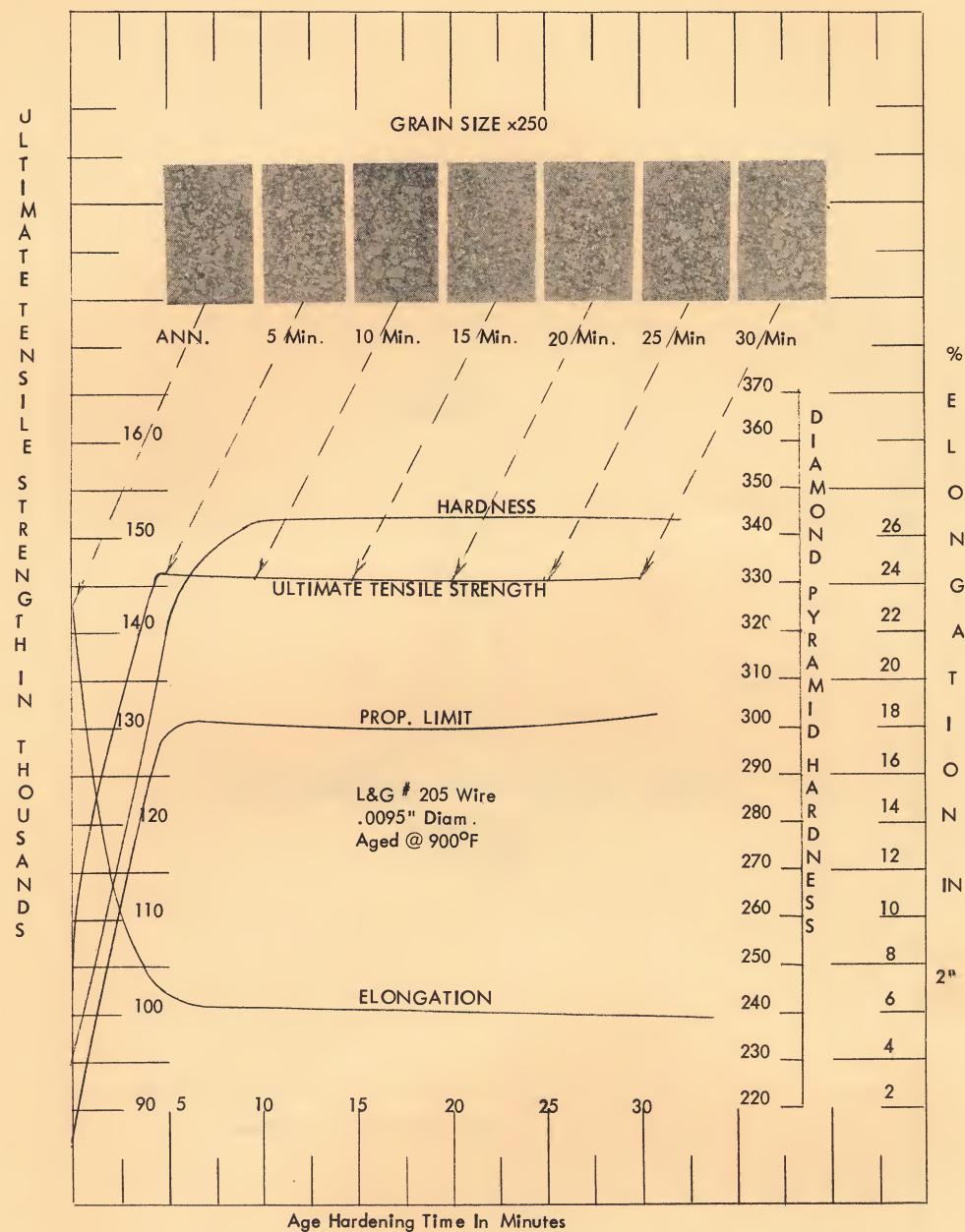
We are particularly proud to be able to offer to you the above stock in the Solution Annealed condition or Age Hardened in continuous lengths on disposable cardboard spools. This stock will pay-off straight with no coil set. Where continuous lengths can be used, cutting to length charges are eliminated and your scrap ends are reduced to a minimum.

We at General Findings Inc. have spared no time or cost to provide the old alloy with a new dress. We are sure that within the limits outlined in this bulletin we can supply consistently uniform stock of L&G #205 which is superior to any competitor's stock available today.

We further control all material closely to the formula by a regular analysis procedure and a lot control program. We will gladly certify all L&G #205 alloy as to both chemical analysis and physical properties, including traceability, at your request.

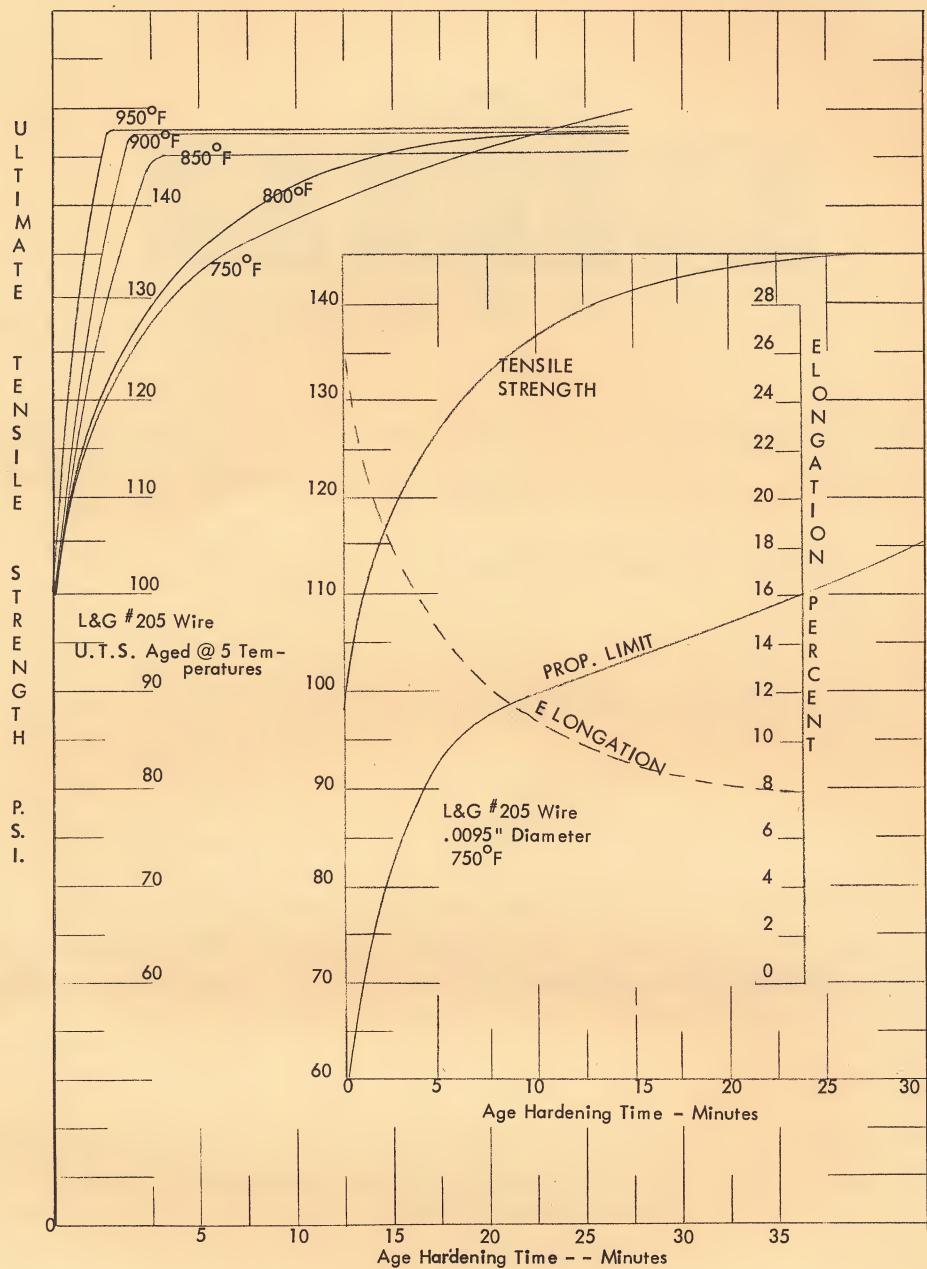
YOUR FIRST CONSIDERATION, THEREFORE, WHEN SPECIFYING STOCK OR PARTS OF L&G #205 SHOULD BE GENERAL FINDINGS INC. WHERE METALLURGICAL PROGRESS KEEPS PACE WITH INDUSTRY'S NEEDS.

PLATE NO. 1



Depicted on this chart are: Grain Size (nominal), D.P.H. 200, Relative Elongation and Ultimate Tensile Strength. This graph is typical; variations in diameter may shift these curves, but not appreciably. When applying this graph to sheet stock, the curves are not absolute. Stock was aged from the Solution Annealed condition.

PLATE NO. 2



A composite graph showing the effect of time and temperature. Time was held constant in each case and temperature varied. Insert graph depicts properties anticipated when temperature is held constant @ 750°F. A vertical line dropped from any temper will indicate the anticipated elongation at the intersection with the dotted line. All figures from the Solution Annealed condition.



NEW ALLOYS OFFER WIDER RANGE OF PHYSICAL PROPERTIES



TECHNICAL BULLETIN #239

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.



TECHNICAL BULLETIN #239

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.

INTRODUCTION

For many years laminates of precious metals or alloys have been used in conjunction with various base metals to exploit the corrosion resistance of the precious metal or alloy while taking advantage of the various desirable physical characteristics of the base metals. Relative costs also are important where, because of the short intended life of the article, solid precious metal, even though it may possess all the desired physical characteristics, can not be used as it may be too expensive.

A base metal desirable for its spring properties is Beryllium Copper. When other metals are laminated to Beryllium Copper, they serve to dampen its action. Several precious metal alloys develop high spring properties when properly solution annealed and aged, but these alloys neither solution anneal nor age at the same temperatures as Beryllium Copper. For this reason L&G #239 was developed.

L&G #239 has a solution annealing range of 1250°F - 1400°F which is comparable to Beryllium Copper, especially its upper range, and ages in the range of 550°F to 650°F which is again in the range of Beryllium Copper.

Spring properties are developed in #239 which are quite comparable to those of Beryllium Copper #25. Hardness values of K₁₀₀ 350 (nominal) on the #239 are obtained when the laminate is aged.

Possessing all the desirable characteristics of a precious metal and the physical characteristics of Beryllium Copper #25, L&G #239 becomes an ideal metal for laminating. The two metals respond as a unit, thus becoming an excellent combination for both service requirements and economy.

A further advantage lies in the ability to produce L&G #239 in various Gold percentages from 40% to 60% Gold content although our standard alloy is 56% Gold. The nominal alloy composition is:

Gold	-	56.25
Palladium	-	10.50
Silver	-	5.25
Copper	-	21.00
Nickel	-	5.25
Zinc	-	1.75

Wear resistance compares favorably to L&G #226 (Technical Bulletin #226). Where the product permits cold work following solution annealing, tempers and wear resistance increase correspondingly and attain very high levels.

SOLUTION ANNEALING & AGE HARDENING

L&G #239 can be solution annealed at temperatures of 1200°F - 1400°F followed by a water quench. When laminated to Beryllium Copper, the usual procedures for Beryllium Copper may be followed. The #239 alloy is not subject to over-ageing, consequently no deleterious effect is created by subjecting the clad #239 material to the long term ageing required by the Beryllium Copper (Plate No. 2).

LAMINATES

The minimum clad ratio of #239 to other bases is 25% of #239 on 75% base metal. Ratios of less than 25% present no problem; however, any increase presents manufacturing problems and are usually of no economic advantage. Higher laminating costs, lower yield and high processing scrap can consume any precious metal savings that may have been anticipated by the use of laminated #239.

AVAILABLE FORMS

Marketed by General Findings, Inc., L&G #239 is available in sheet and wire in the solid alloy. In addition to laminations on Beryllium Copper, previously mentioned, L&G #239 may be laminated to Phosphor Bronze "C," 18% Nickel Silver and others of lesser importance.

QUOTATIONS

Information contained herein would enable the customer to age this alloy. But for good control we strongly recommend that this function be left with General Findings whose research has been far deeper than this brochure can properly detail.

While solid mill forms and laminated strip may be obtained, it is recommended that the customer consider the purchase of completed parts to insure adequate control of ageing and the optimum of service.

For quotations or advice on this alloy, address your inquiries to:

Industrial Division
General Findings, Inc.
Attleboro, Mass. 02703

YOUR FIRST CONSIDERATION, THEREFORE, WHEN SPECIFYING STOCK OR PARTS OF L&G #239, WHETHER SOLID OR LAMINATED, SHOULD BE GENERAL FINDINGS, INC., WHERE METALLURGICAL PROGRESS KEEPS PACE WITH INDUSTRY'S NEEDS.

PHYSICAL PROPERTIES OF L&G #239 ALLOY

Resistivity (ohms/cm ²)	-	170
Density (grams/cc)	-	13.4
Density (dwt. /cu. in.)	-	141.0
Temp. of Fusion °F	-	2100

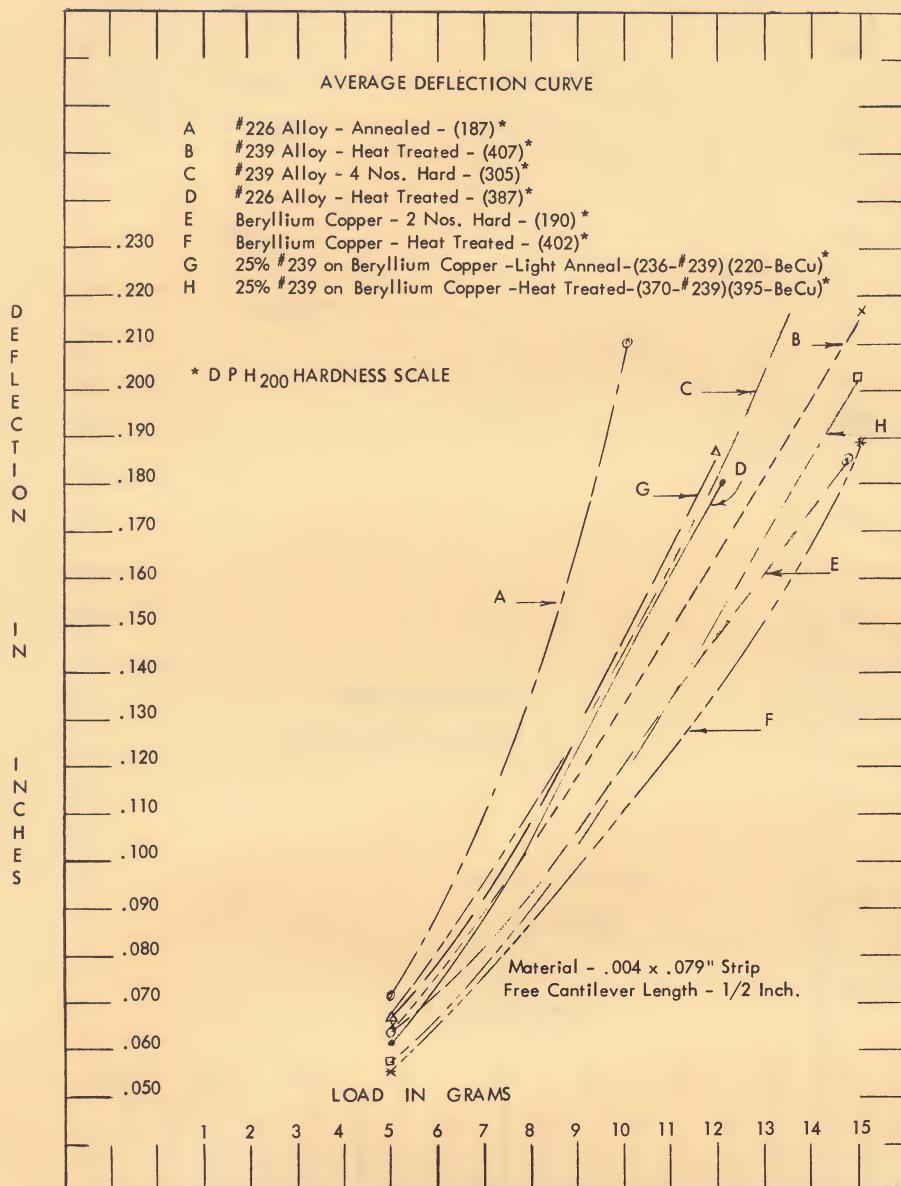
L&G #239 WIRE

	<u>Solution Annealed</u>	<u>Heat Treat From Solution Annealed</u>	<u>Heat Treat From 50% Cold Worked</u>
Ultimate Tensile Strength	90000 - 105000	155000 - 170000	190000 - 210000
Proportional Limit	40% of U. T. S.	55% of U. T. S.	70% of U. T. S.
% Elongation (10" length)	45	3 - 4	Under 3
Modulus of Elasticity	12.6×10^6		
Diamond Pyramid Hardness (200 gr.)	200 - 210	350 - 380	390 - 425
Knoop Hardness (100 gr.)	190 - 200	340 - 370	380 - 415

L&G #239 SHEET

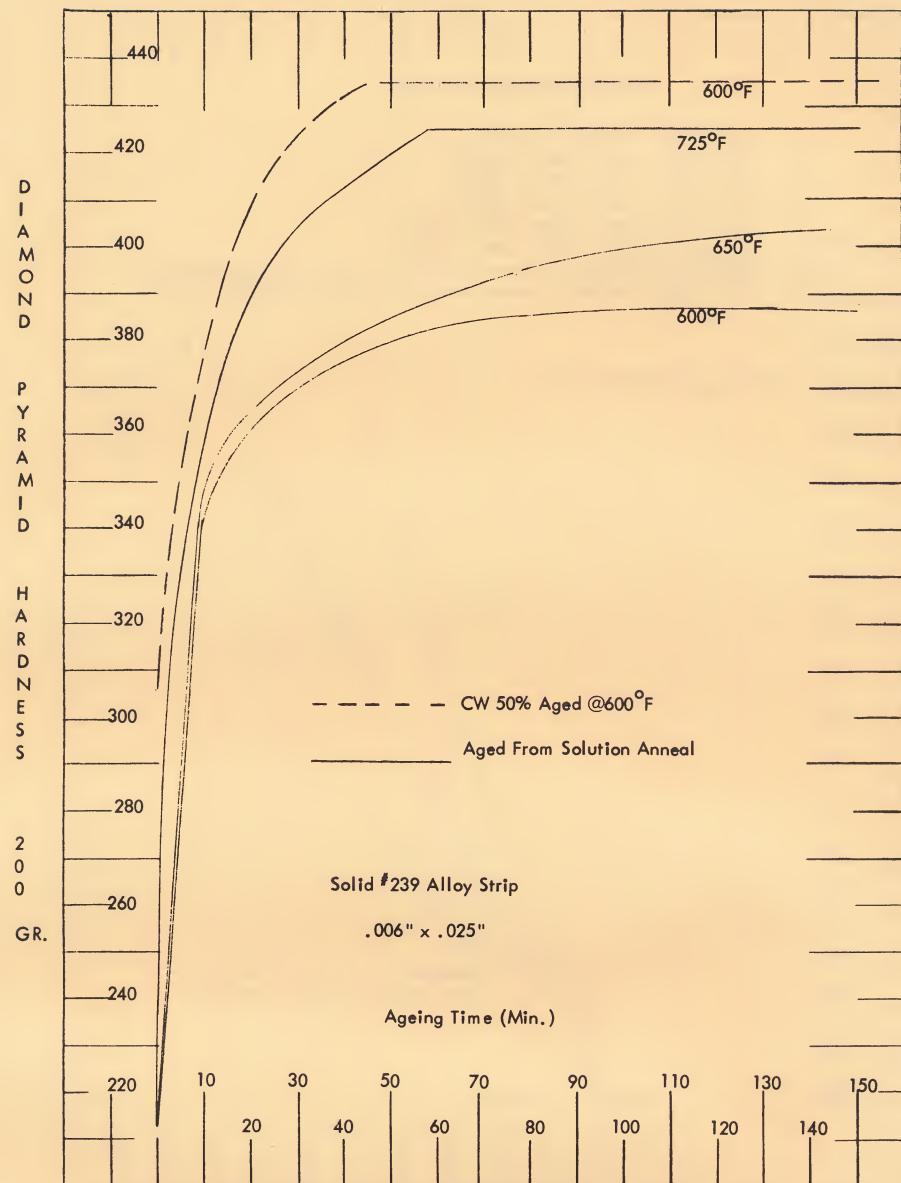
	<u>Solution Annealed</u>	<u>Heat Treat From Solution Annealed</u>	<u>Heat Treat From 50% Cold Worked</u>
Ultimate Tensile Strength	85000 - 110000	155000 - 165000	180000 - 200000
Proportional Limit	40% of U. T. S.	55% of U. T. S.	70% of U. T. S.
% Elongation (10" length)	45	3 - 4	Under 3
Modulus of Elasticity	12.6×10^6		
Diamond Pyramid Hardness (200 gr.)	200 - 210	340 - 380	370 - 420
Knoop Hardness (100 gr.)	200 - 220	330 - 370	360 - 410

PLATE NO. 1

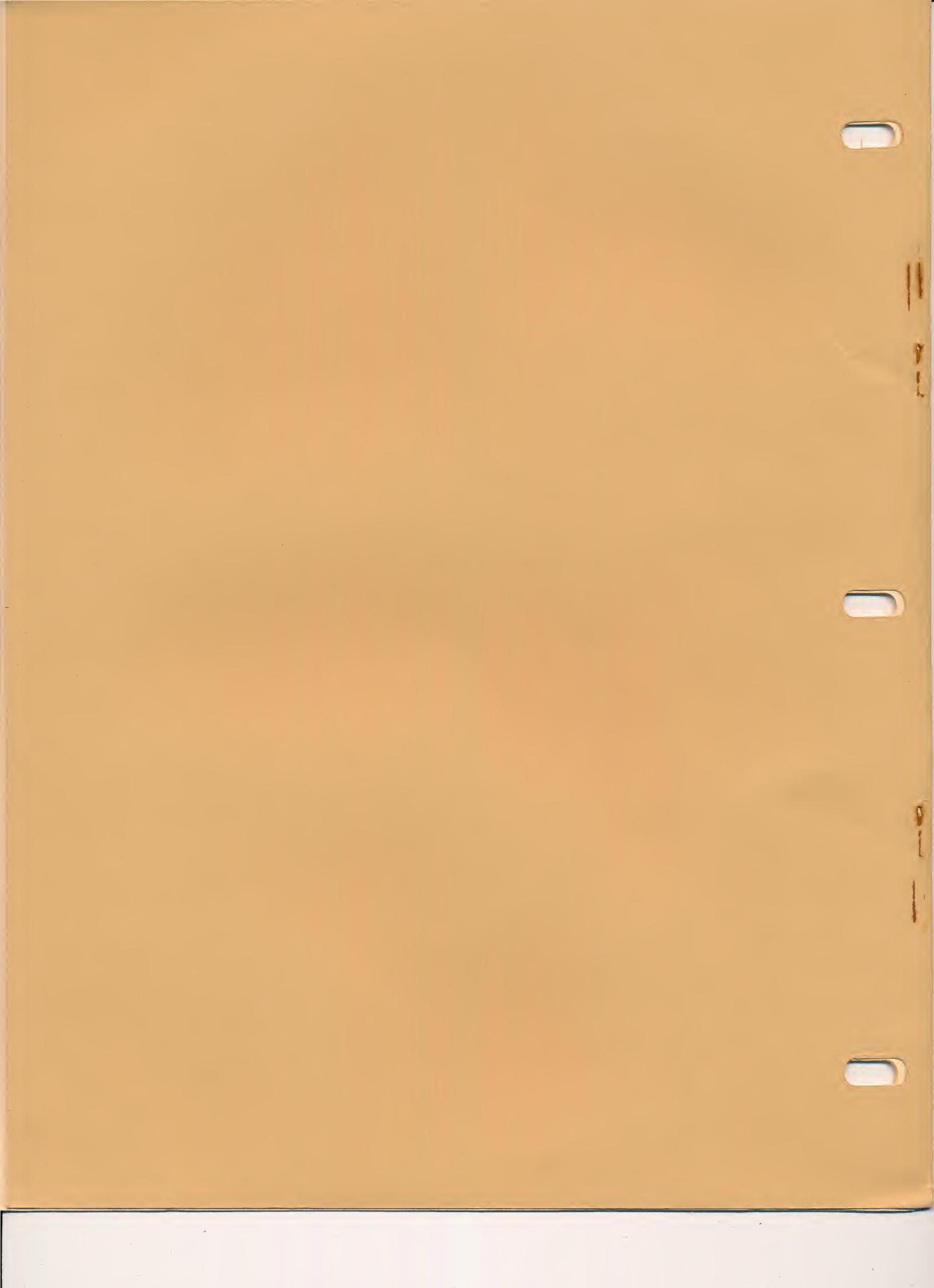


A composite of deflection curves of Beryllium Copper #25, L&G #239 and 25% L&G #239 laminated on 75% Beryllium Copper. Test results were on strip .004" x .079". Free cantilever length - 1/2".

PLATE NO. 2



Illustrates typical age hardening rates for solid #239 Alloy. This plate shows the rapid response time of this alloy and the uniformity of temper once the optimum has been reached.



NEW ALLOYS OFFER WIDER RANGE OF PHYSICAL PROPERTIES



TECHNICAL BULLETIN #215

MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.



TECHNICAL BULLETIN #215

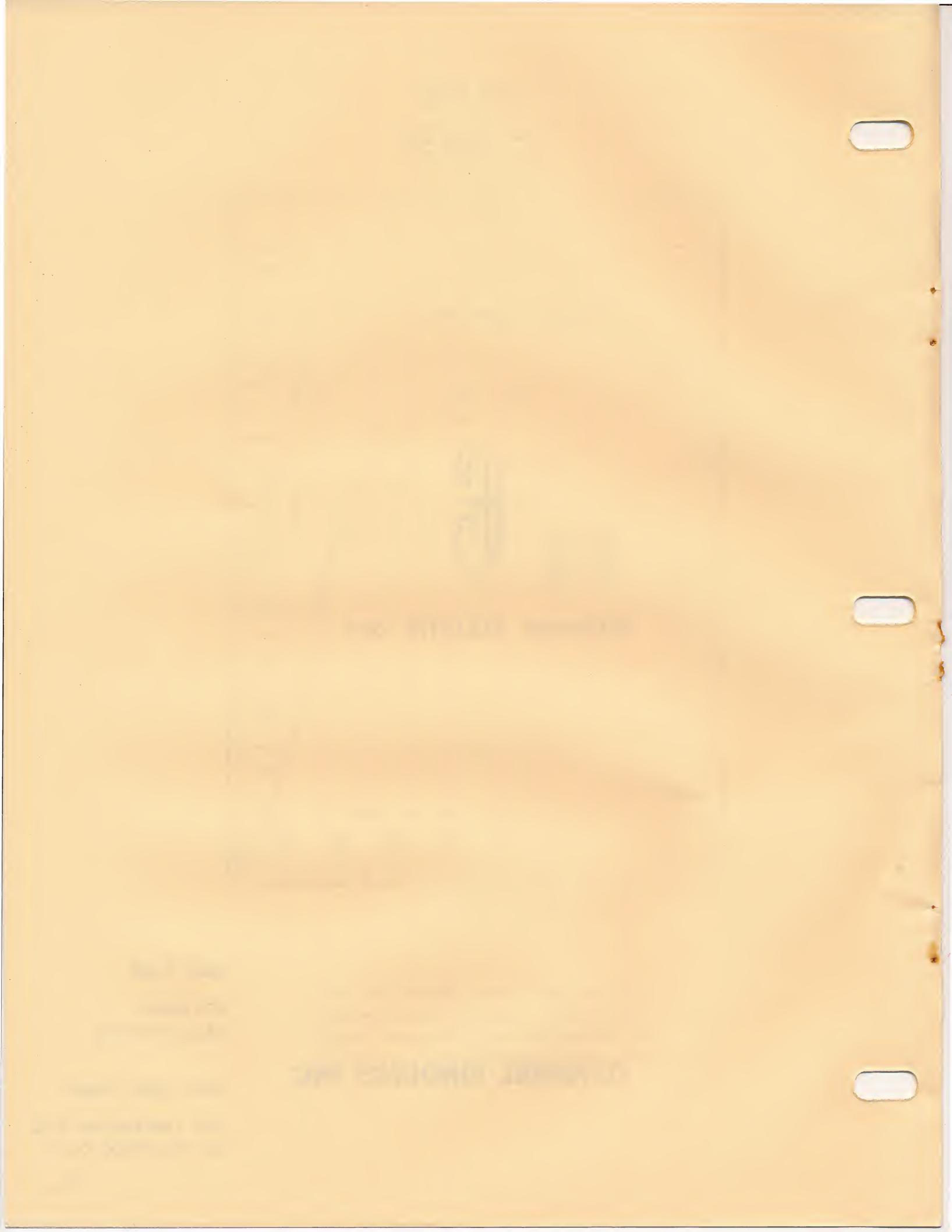
MAIN PLANT

ATTLEBORO
MASSACHUSETTS

GENERAL FINDINGS INC.

WEST COAST PLANT

7327 LANKERSHIM BLVD.
NO. HOLLYWOOD, CALIF.



INTRODUCTION

L&G #215 alloy is basically a hard, fine grained, highly wear resistant White Gold. Among the precious metals commonly used for springs, wipers and brushes, this alloy has perhaps the lowest wear rate under comparable conditions.

L&G #215 is formulated to the following nominal compositions:

Gold	-	75.00 %
Copper	-	1.08 %
Nickel	-	18.50 %
Zinc	-	<u>5.42 %</u>
Total	-	100.00 %

This alloy has been used as twisted flat wire contacts in Synchros for many years. More recently it is being used for potentiometer wipers where wear is a factor.

Marketed through General Findings Inc., affiliate of Leach and Garner Company, L&G #215 is available in round wire to .005" diameter and in sheet and strip to .002" gauge. General Findings Inc. not only markets mill form material, but also fabricates parts to customer's specifications. There are many reasons why customers should prefer to purchase finished parts. As explained under "Tempers," L&G #215 may require special handling procedures that can best be handled by General Findings Inc.

PHYSICAL PROPERTIES

Resistivity ohms /cmf (nominal)	239
Modulus (Young's)	16.6×10^6
Melting Temperature	1730°F
Density gr. /cc. (nominal)	14.6
Dwt. /cu. in. (nominal)	153.7
Color	Nickel White

MECHANICAL PROPERTIES (ANNEALED)

	<u>Sheet</u>	<u>Wire</u>
Ultimate Tensile Strength	110,000 - 120,000	120, 000 - 130,000
Temper - DPH ₂₀₀ gr.	265 - 275	260 - 270
Elongation % in 2" (nominal)	24%	26%

TEMPERED STOCK

Many factors are involved which affect the Mechanical Properties of tempered stock. As a result, these are not shown in tabular form. Please refer to the graphs showing the properties attained by various treatments for the production of temper.

TEMPERS — GENERAL INFORMATION

Published literature assumes that this alloy could be hardened by cold work only. However, research done by Leach and Garner Co. and General Findings Inc. now proves that the alloy can be age hardened to Knoop ₁₀₀ 350-360 levels by the proper control of time and temperature. This opens a whole new concept of this alloy.

Among the graphs appended is illustrated a typical cold worked series of tempers. Work hardening very rapidly, this alloy has had to be stress relieved to provide the ductility required for forming. Stress relieving has led to a variety of problems that can now be solved by age hardening.

Cold worked stock is in the order of Knoop ₁₀₀ values of 350-360 with very low elongation. Stress relieving is not precise. It is accomplished by heating to temperatures below recrystallization for a definite time. The temper and tensile strength attained by cold work is the sum of plastic deformation and residual stresses. These are variable factors that can not be predicted except in a general way. Consequently, stress relief can produce a wide uncontrolled variety of temper and tensile results with no apparent change in the metal structure. As a result of this poorly controlled condition, variations of wear and spring factors do occur which are highly undesirable.

Annealed or heavily stress relieved in the Knoop 100gr. range of 260-290, followed by age hardening to the original temper, provides the ideal solution. In this condition forming can be done and the finished parts aged to Knoop 100 gr. 340-350 levels restoring spring properties and wear to the original cold worked values. The appended graphs illustrate the wide range of tempers, tensile strengths and elongation accompanying various treatments.

MAGNETIC SUSCEPTIBILITY

L&G #215 alloy is magnetic due to the 18.5% Nickel in the alloy. Of course, in applications where magnetic materials can not be used, it should not be considered. The designer, however, may need a precious metal contact and magnetic armature. It is quite conceivable that armature, return spring and contact could all be incorporated in one piece when made from L&G #215 alloy.

USES

At General Findings we realize that little work has been done to try L&G #215 in applications where other alloys are presently being used. One reason is the former problem of temper loss on stress relieving. As pointed out, this no longer is a problem. Lack of time and facilities has prevented our companies from a full investigation of L&G #215's use potential. We do strongly urge that design engineers consider this alloy where wear factors are required. The high nobility of this alloy makes it very corrosion resistant to all normal atmospheres including sulphur.

PARTS V. STOCK

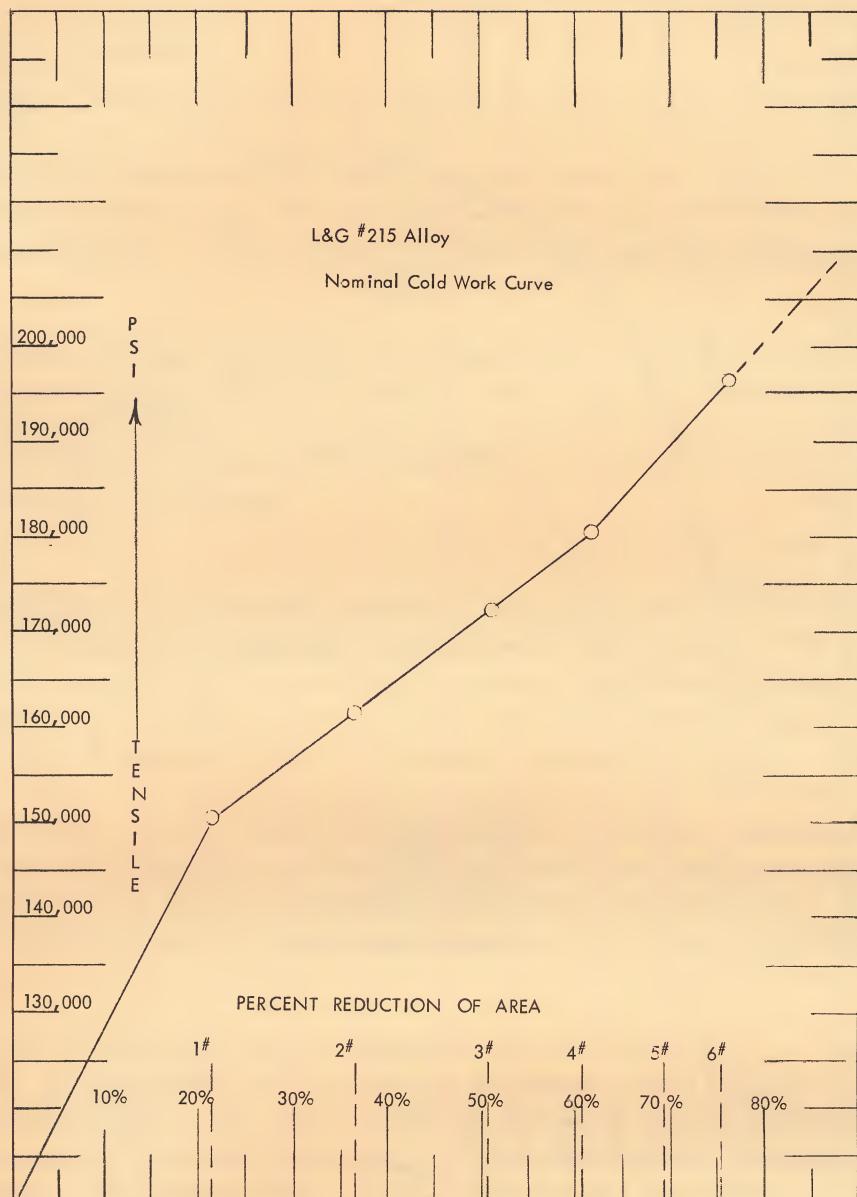
Most leading manufacturers find it desirable to receive finished parts as very few have the facilities to produce the precise control of tempers and tensile strength usually required. General Findings performs custom heat treating on parts formed by the customer. In this event, it is mandatory that the parts be properly identified as having been made from a lot or order. The reason lies in our ability to cross reference the original processing of the stock which can then be related to the proper ageing requirements. Without the prior knowledge of process treatment, proper ageing can not be done.

Our companies are ready to assist you in providing information and test samples.

YOUR FIRST CONSIDERATION, THEREFORE, WHEN
SPECIFYING STOCK OR PARTS OF L&G #215 SHOULD
BE GENERAL FINDINGS INC. WHERE METALLURGICAL
PROGRESS KEEPS PACE WITH INDUSTRY'S NEEDS

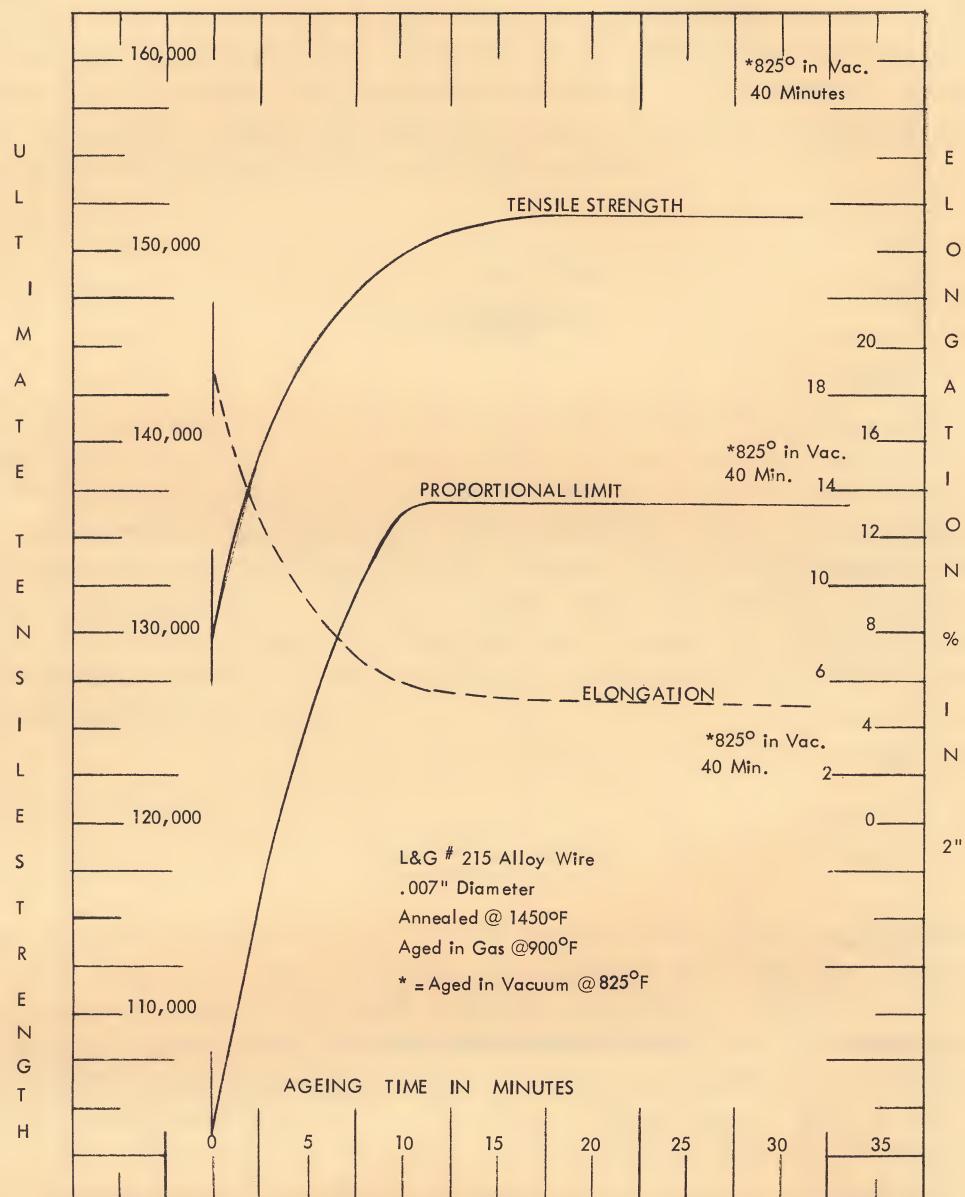
PLATE NO. 1

L&G ALLOY #215



This curve is basic and typical of the cold worked characteristics of L&G #215 alloy strip.

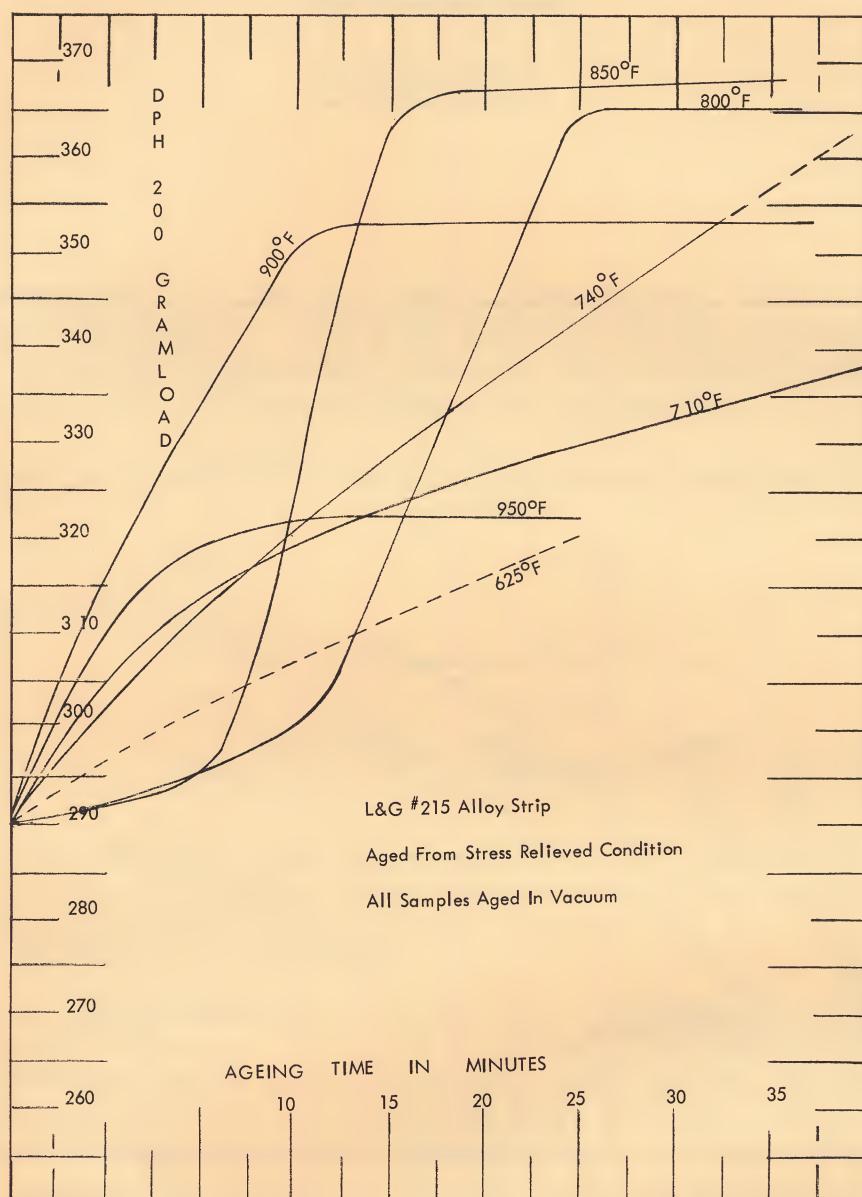
PLATE NO. 2
L&G ALLOY #215



This plate shows nominal ageing from the annealed condition. Curves represent an extension of time to 40 minutes by extrapolation.

PLATE NO. 3

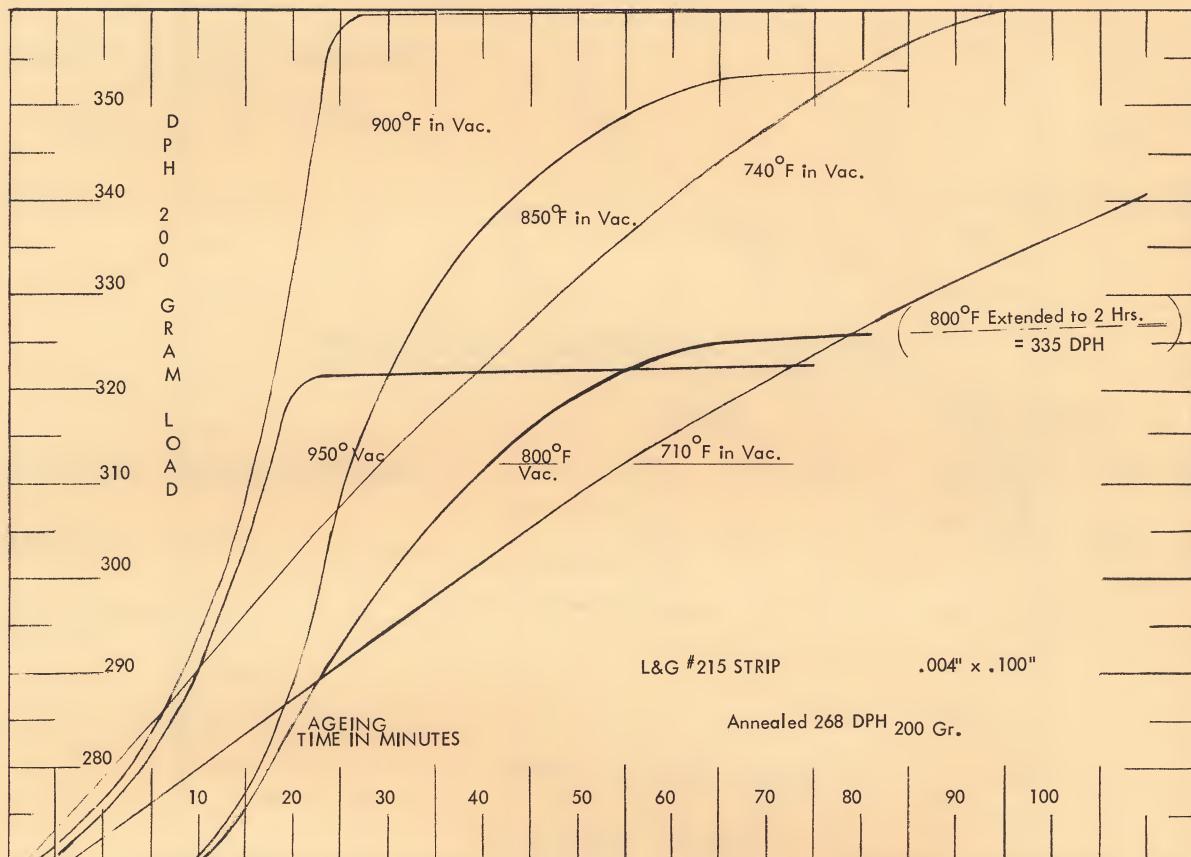
L&G ALLOY #215



L&G #215 strip. Aged in vacuum from the Stress Relieved Condition for time and temperatures noted. These curves are nominal and represent an average of 10 samples all aged from DPH₂₀₀ 290. Stock gauge .004" x .125" wide.

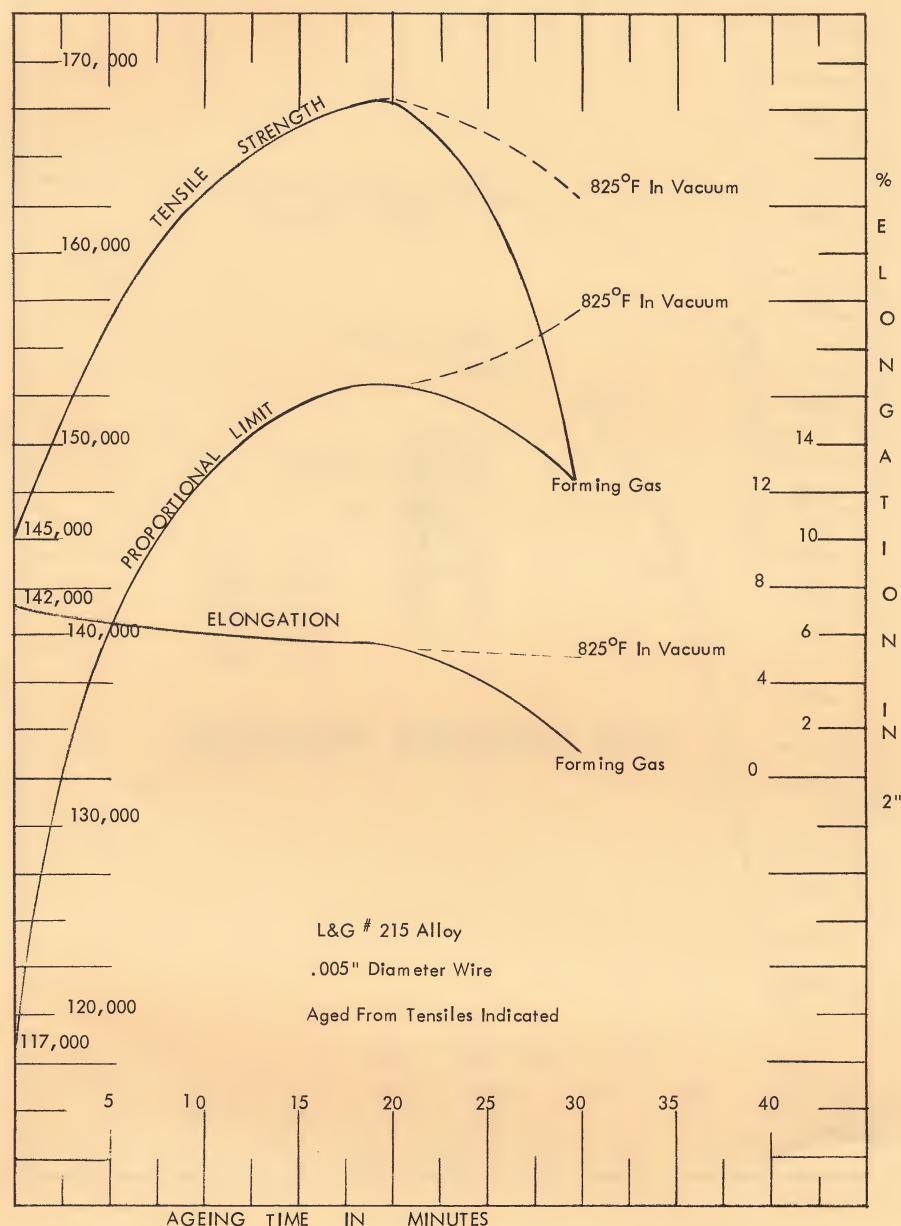
PLATE NO. 4

L&G ALLOY #215



L&G #215 strip aged from the annealed condition. The initial temper as annealed was DPH₂₀₀ 268. 850°F has been used extensively as a basic temperature as this curve shows adequate control of time at temperature. Note that 950°F does not attain high hardness value and 900°F rises too sharply to control the ultimate hardness.

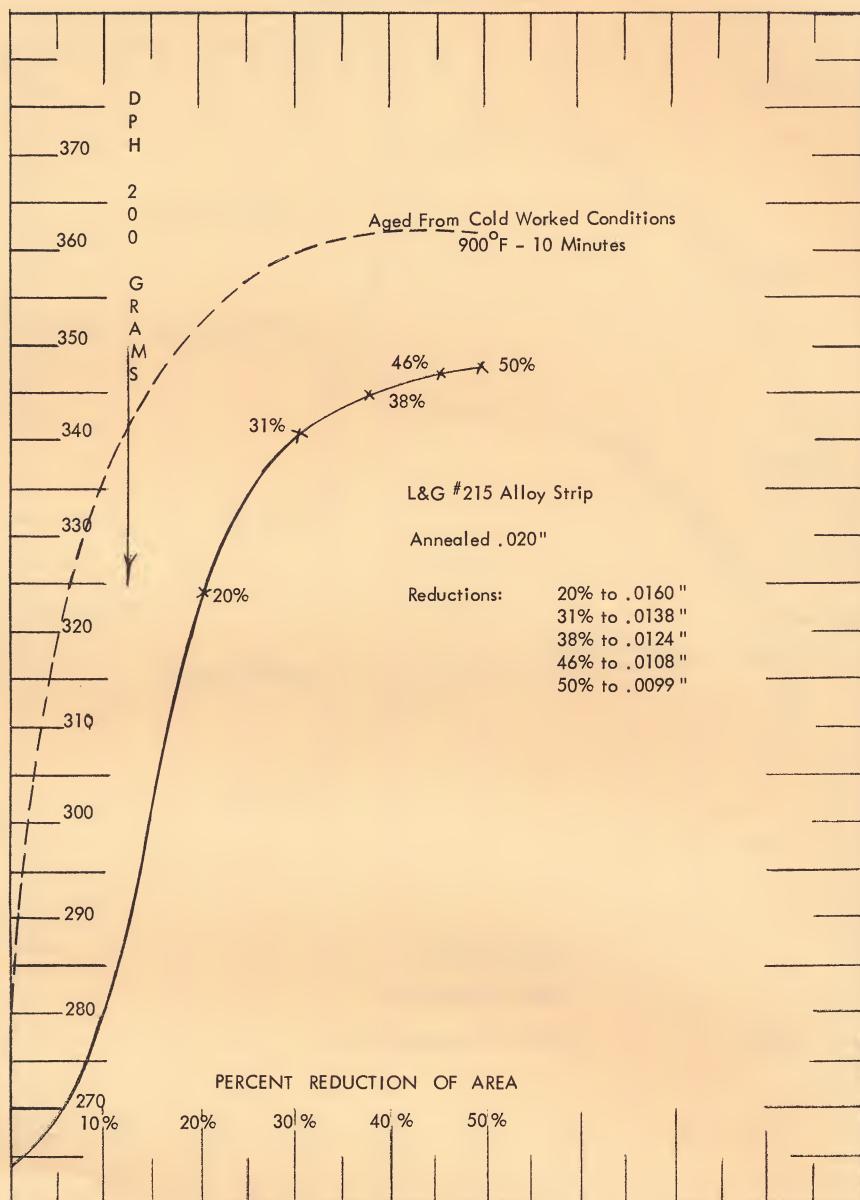
PLATE NO. 5
L&G ALLOY #215



A comparison of the effect of forming gas (20%H₂ - 80%N₂) vs. vacuum ageing. Note the overageing in gas.

PLATE NO. 6

L&G ALLOY #215



L&G #215 alloy aged from various cold work percentages. The smooth curve bears out the relationship of hardness values expected when the alloy precondition is known.

